IN THE CLAIMS:

Please amend claims 1, 2, 4, 6, 9, 10, 12, 13, 17, 21 and 29 and cancel claims 3, 5, 7, 8, 14, 15, 18-20, 22-28, and 30-74.

Claim 1 (Currently Amended): A method for estimating a ~~the~~ maximum discharge power of a battery, comprising:

generating a signal indicative of a present state-of-charge of said battery, utilizing a sensor;

calculating said present state-of-charge of said battery based on said signal, utilizing an arithmetic circuit operably coupled to said sensor;

calculating a maximum discharge current of said battery utilizing said arithmetic circuit based on at least a minimum state-of-charge limit associated with said battery, said present state-of-charge of said battery, and a minimum voltage limit ~~limits of~~ associated with said battery such that a future output voltage of said battery does not fall below said minimum voltage limit and a future state-of-charge of said battery does not fall below said minimum state-of-charge limit associated with said battery; and,

calculating said maximum discharge power based on said maximum discharge current value, utilizing said arithmetic circuit.

Claim 2 (Currently Amended): The method of claim 1, wherein said step of calculating said maximum discharge current is also based on a maximum current limit associated with said battery ~~further comprising:~~

~~calculating a maximum discharge current of said battery based on state-of-charge limits of said battery;~~

~~calculating a maximum discharge current of said battery based on current limits of said battery;~~

~~wherein said maximum discharge power is calculated from a minimum value of discharge current chosen among said calculated maximum discharge current based on voltage limits, said calculated maximum discharge current based on state-of-charge limits, and said calculated maximum discharge current based on current limits.~~

Claim 3 (Cancelled).

Claim 4 (Currently Amended): The method of claim 1, 2 further comprising calculating said present state-of-charge of said battery ~~wherein said step of calculating maximum discharge current of said battery based on state of charge limits obtains a state of charge by~~ using a Kalman filtering method.

Claim 5 (Cancelled).

Claim 6 (Currently Amended): The method of claim 1, 2 wherein said battery is a battery pack comprising at least one cell~~n cells~~.

Claims 7-8 (Cancelled).

Claim 9 (Currently Amended): The method of claim 1, wherein said step of calculating maximum discharge current of said battery is also based on ~~voltage limits uses~~ a cell model.

Claim 10 (Currently Amended): The method of claim 9, wherein said cell model is solved by a Taylor-series expansion.

Claim 11 (Original): The method of claim 9 wherein said cell model is solved by using a discrete time-state space model.

Claim 12 (Currently Amended): The method of claim 9 wherein said battery is a battery pack comprising at least one cell ~~n cells~~.

Claim 13 (Currently Amended): The method of claim 12 wherein said cell model is

$v_k(t+\Delta t)=OCV(z_k(t+\Delta t)) - R \times i_k(t)$

wherein $v_k(t+\Delta t)$ denotes ~~the~~ a cell voltage for a cell k for ~~the~~ a time period Δt units into the future, $OCV(z_k(t+\Delta t))$ denotes an ~~the~~ open cell voltage as a function of a state-of-charge ~~the state of charge~~ z_k for cell k for a ~~the~~ time period Δt units into the future, R is a constant that denotes an ~~the cell's~~ internal resistance of said cell k, and $i_k(t)$ denotes a ~~the~~ cell current for cell k.

Claims 14-15 (Cancelled).

Claim 16 (Original): The method of claim 13 wherein said cell model is solved by using a discrete time-state space model.

Claim 17 (Currently Amended): The method of claim 16 wherein said discrete time-state space model is

$x_k[m+1]=f(x_k[m],u_k[m])$

$v_k[m]=g(x_k[m],u_k[m])$

wherein m denotes a ~~the~~ discrete time sample index, $x_k[m]$ denotes a ~~the~~ vector function of time and a ~~the~~ state of the battery ~~system~~, $u_k[m]$ denotes an ~~the~~ input to the battery ~~system~~ and includes cell current $i_k[m]$ as a component, and $f(\cdot)$ and $g(\cdot)$ are functions chosen to model ~~the~~ cell dynamics.

Claims 18-20 (Cancelled).

Claim 21 (Currently Amended): The method of claim 17 wherein $t_{\max,k}^{discrete}$ is found by looking for t_k that causes equality in

$$v_{\min} = g(x_k[m+T], u_k[m+T])$$

wherein $g(x_k[m+T], u_k[m+T])$ is utilized to determine ~~finds~~ the cell voltage for the cell k at a predetermined time in ~~At seconds into~~ the future.

Claims 22-28 (Cancelled).

Claim 29 (Currently Amended): The method of claim 1, ~~2~~ wherein said calculated maximum discharge power is checked to ensure that it falls within power limits of said battery.

Claims 30-74 (Cancelled).

Please add new claim 75.

Claim 75 (New): A system for estimating a maximum discharge power of a battery, comprising:

a sensor configured to generate a signal indicative of a present state-of-charge of said battery; and

an arithmetic circuit operably coupled to said sensor, said arithmetic circuit configured to calculate said present state-of-charge of said battery based on said signal, the arithmetic circuit further configured to calculate a maximum discharge current of said battery based on at least a minimum state-of-charge limit associated with said battery, said present state-of-charge of said battery, and a minimum voltage limit associated with said battery such that a future output voltage of said battery does not fall below said minimum voltage limit and a future state-of-charge of said battery does not fall below said minimum state-of-charge limit, said arithmetic circuit further configured to calculate said maximum discharge power based on said maximum discharge current value.